

REMARKS/ARGUMENTS

Claims 20, 23-29, 31, and 34-38 are pending in this application. By this amendment, Applicant amends Claims 20 and 31 and cancels Claims 22 and 33.

Claims 20, 22, 23, 25-27, 29, and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. (JP 2002-270036) in view of Felten (U.S. 4,598,037). Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. in view of Felten, and further in view of Kubota (U.S. 6,531,257). Claim 28 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. in view of Felten, and further in view of Iguchi et al. (U.S. 6,197,480). Claims 31, 33, 34, 36, and 38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. Claim 35 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. in view of Kubota. Applicant notes that the Examiner clearly inadvertently omitted Sugiura et al. from the rejection of claim 35 since claim 35 is dependent upon claim 31, which was rejected over Sugiura et al., and Sugiura et al. is specifically discussed in the body of the rejection. Claims 22 and 33 have been canceled. Applicant respectfully traverses the rejections of Claims 20, 23-29, 31 and 34-36.

Claim 20 has been amended to recite:

A method for forming a thick film pattern, comprising the steps of:
applying to a support **a photosensitive paste including a conductive powder, a photosensitive monomer, a photopolymerization initiator, and a polymer**, wherein a ratio of the photosensitive monomer to a total amount of the photosensitive monomer and the polymer satisfies the condition represented by the following Formula:

$$\frac{\text{photosensitive monomer}}{(\text{photosensitive monomer} + \text{polymer})} \geq 0.90,$$

so as to form a photosensitive paste film;
subjecting the photosensitive paste film to an exposure treatment;
and
developing the photosensitive paste film subjected to the exposure treatment so as to form a thick film pattern; wherein

the contents of the conductive powder, the photosensitive monomer, and the photopolymerization initiator constituting the photosensitive paste are within the following ranges:

conductive powder: about 60 to about 90 percent by weight of the photosensitive paste;

photosensitive monomer: about 5 to about 39 percent by weight of the photosensitive paste;

photopolymerization initiator: about 1 to about 10 percent by weight of the photosensitive paste; and

the photosensitive paste includes a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g. (emphasis added)

Applicant's Claim 31 recites features that are similar to the features recited in Applicant's Claim 20, including the above-emphasized features.

The Examiner alleged that Sugiura et al. teaches all of the features and steps recited in Applicant's Claims 20 and 31, except for the photosensitive paste recited in Applicant's Claims 20 and 31 and a process of forming a pattern as recited in Applicant's Claim 20. However, the Examiner alleged, "[I]t would have been obvious to one of ordinary skill in the art at the time of the invention to obtain the paste of claim 20 [and claim 31] based on Sugiura's teachings regarding the components of the paste and the amount of each component." In addition, the Examiner alleged that Felten teaches a process of forming fine lines and spaces. Thus, the Examiner concluded that it would have been obvious "to use the paste of Sugiura et al. in the process of forming fine lines and spaces, as taught by Felten, in order to take advantage of the fact that the conductor paste of Sugiura et al. does not need a solvent removing step after application on a substrate."

The Examiner alleged that Embodiments 1 and 2 in paragraphs [0034] and [0035] of Sugiura et al. in combination with the disclosure in paragraph [0025] of Sugiura et al. teach the specific weight percentages of the various elements of the photosensitive conductor paste and the ratio of photosensitive monomer/(photosensitive monomer + polymer) as recited in claims 20 and 31.

Applicant respectfully disagrees with the Examiner's allegations.

Embodiments 1 and 2 in paragraphs [0034] and [0035] of Sugiura et al. in combination with the disclosure in paragraph [0025] of Sugiura et al. may, at best, arguably teach some weight percentages of some elements of a photosensitive conductor paste. However, paragraphs [0034] and [0035] of Sugiura et al. fail to teach or suggest any specific amount of polymer or even that a polymer is or could be included in the organic vehicle disclosed therein. Paragraph [0025] of Sugiura et al. discloses that the organic vehicle "can contain polymer." However, neither paragraph [0025] nor any other portion of Sugiura et al. teaches or suggests that the organic vehicle **must** contain a polymer.

Since paragraphs [0034] and [0035] of Sugiura et al. fail to teach or suggest that the conductive paste disclosed therein includes any polymer whatsoever and neither paragraph [0025] nor any other portion of Sugiura et al. teaches or suggests that the organic vehicle must necessarily contain a polymer, contrary to the Examiner's allegations, the combination of embodiments 1 and 2 disclosed in paragraphs [0034] and [0035] of Sugiura et al. and the disclosure in paragraph [0025] of Sugiura et al. clearly fails to teach or suggest the features of "a photosensitive paste including a conductive powder, a photosensitive monomer, a photopolymerization initiator, and a polymer" and "photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.90 " as recited in Applicant's Claim 20, and similarly in Applicant's Claim 31.

In addition, in order to more clearly distinguish the present claimed invention over the applied prior art, Applicant's Claims 20 and 31 have been amended to recite the feature of "the photosensitive paste includes a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g." Support for this features is found, for example, in Applicant's original Claims 22 and 33.

With respect to Applicant's original Claims 22 and 33, the features of which are now recited in Applicant's Claims 20 and 31, the Examiner alleged that paragraph [0021] of Sugiura et al. teaches the feature of "the photosensitive paste includes a

photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g.” Particularly, the Examiner alleged that compounds, such as trimethylopropane triacrylate, dipentaerythritol pentaacrylate, and dipentaerythritol hexaacrylate disclosed in paragraph [0021] of Sugiura et al. are equivalent to the photosensitive monomers having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g.

However, neither paragraph [0021] of Sugiura et al. nor any other evidence of record supports the Examiner’s allegations that any of trimethylopropane triacrylate, dipentaerythritol pentaacrylate, or dipentaerythritol hexaacrylate disclosed in paragraph [0021] of Sugiura et al. is equivalent to the photosensitive monomers having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g. In fact, Sugiura et al. fails to teach or suggest anything at all about a double bond concentration of any of the compounds disclosed therein, and certainly fails to teach or suggest that a photosensitive conductive paste could or should include a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g or that any advantages or benefits would or could have been obtained thereby.

The Examiner is reminded that prior art rejections must be based on evidence. *Graham v. John Deere Co.*, 383 U.S. 117 (1966).

Further, as noted above, Sugiura et al. fails to teach or suggest that the organic vehicle must contain a polymer, and thus, certainly fails to teach or suggest that the conductive paste must include **both** the polymer **and** a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g.

Thus, contrary to the Examiner’s allegations, Sugiura et al. clearly fails to teach or suggest the feature of “the photosensitive paste includes a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g” as recited in Applicant’s Claims 20 and 31.

The Examiner relied upon Felten merely to allegedly teach a step of solvent

developing a pattern to remove unexposed portions of layer, which the Examiner alleged is equivalent to the step of “developing the photosensitive paste film subjected to the exposure treatment so as to form a thick film pattern” recited in Applicant’s Claim 20. However, Felten clearly fails to teach or suggest the features of “a photosensitive paste including a conductive powder, a photosensitive monomer, a photopolymerization initiator, and a polymer,” “photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.90 ,” and “the photosensitive paste includes a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g” as recited in Applicant’s Claim 20, and similarly in Applicant’s Claim 31. Thus, Felten fails to cure the deficiencies of Sugiura et al. described above.

In addition, contrary to the Examiner’s allegations, it would not have been obvious to combine the alleged teachings of Felten with Sugiura et al. Sugiura et al. specifically discloses a **solventless** photo-curing conductive paste and manufacturing method for a ceramic component using the **solventless** photo-curing conductive paste, whereas, as acknowledged by the Examiner, Felten specifically teaches a step of **solvent** developing a pattern to remove unexposed portions of layer. Since Sugiura et al. specifically discloses a **solventless** photo-curing conductive paste and manufacturing method for a ceramic component using the **solventless** photo-curing conductive paste, no one of ordinary skill in the art would have combined the step of **solvent** developing a pattern to remove unexposed portions of layer in the method of Sugiura et al., because such a combination would render the method of Sugiura et al. completely unsatisfactory for its intended purpose of providing a conductive paste without needing a solvent removing process after application thereof (see, for example, the English language Abstract of Sugiura et al.).

The Examiner is reminded that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and MPEP § 2143.01.

For at least the reasons described above, Sugiura et al. and Felten, applied alone or in combination fail to teach or suggest the unique combination and arrangement of features recited in Applicant's Claims 20 and 31.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claims 20 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Sugiura et al. in view of Felten.

The Examiner relied upon Kubota et al. and Iguchi et al. to allegedly cure deficiencies of Sugiura et al. and Felten. However, Kubota et al. and Iguchi et al. fail to teach or suggest the features of "a photosensitive paste including a conductive powder, a photosensitive monomer, a photopolymerization initiator, and a polymer," "photosensitive monomer/(photosensitive monomer + polymer) \geq 0.90," and "the photosensitive paste includes a photosensitive monomer having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g" as recited in Applicant's Claim 20, and similarly in Applicant's Claim 31. Thus, Kubota et al. and Iguchi et al. clearly fail to cure the deficiencies of Sugiura et al. and Felten described above.

Accordingly, Applicant respectfully submits that Sugiura et al., Felten, Kubota et al., and Iguchi et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant's Claims 20 and 31.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claims 20 and 31 allowable. Claims 23-29 and 34-38 depend upon Claims 20 and 31, and are therefore allowable for at least the reasons that Claims 20 and 31 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

Application No. 10/596,000
September 8, 2011
Reply to Office Action dated March 11, 2011
Page 12 of 12

To the extent necessary, Applicant petitions the Commissioner for a Three-Month Extension of Time, extending to September 12, 2011 (September 11, 2011 falls on a Sunday), the period for response to the outstanding Office Action date March 11, 2011.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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